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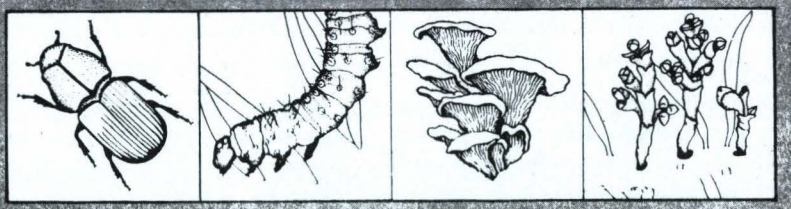

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DAMAGE BY THE BUDWORM, ARGYROTAENIA SP., ON THE WALLACE AND CABINET RANGER DISTRICTS, IDAHO PANHANDLE AND KOOTENAI NATIONAL FORESTS 1980

By

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ABSTRACT

A budworm, Argyrotaenia sp., outbreak was first discovered in 1978, on about 40 acres of mountain hemlock and associated conifers on the Wallace Ranger District, Idaho, Panhandle National Forests. By 1980 the defoliation covered 11,050 acres and spread from the Wallace District to the Cabinet District, Kootenai National Forest, Montana.

More information has been gained on the budworm's life history and habits. Three insecticides for controlling the budworm were screened by the Pacific Southwest Experiment Station. Larval mortality was high during the summer of 1980 and the infestation is predicted to decrease during 1981.

INTRODUCTION

In 1978, an unknown budworm was discovered defoliating mountain hemlock and other conifers in the Shoshone drainage of the Wallace Ranger District, Idaho Panhandle National Forests. It has been tentatively identified 1/ as Argyrotaenia sp., near gogana (Kearfott) (Tunnock and Hard, 1980). The infestation has increased in size each year since 1978.

This is a report on the current status of the infestation, some additional notes on the budworm's life cycle and habits, and a report of research activities associated with A. gogana.

INFESTATION STATUS

The infested area increased from about 40 acres in 1978, to several thousand acres in 1979, and to 11,050 acres in 1980. In 1980, 4,520 acres of this defoliation were on the Wallace District and 6,530 acres were on the Cabinet Ranger District in Montana (figure 1 - map, page 4).

Defoliation around the Ulm Peak area (Cabinet District) was very heavy in 1979 and 1980. Some understory mountain hemlock (6-10 feet high) that were severely damaged in 1979, were dead or top-killed in 1980 along the Ulm Peak Road (figure 2).

Near the end of September 1980, last instar larvae were hard to find on defoliated trees in the Ulm Peak area. This suggests that mortality was very high during the summer and the infestation will decrease in 1981. Defoliation did decrease during 1980 in the original outbreak area on the west side of Shoshone Creek.

1/ Identified by Dr. Jerry A. Powell, Professor of Entomology, University of California, Berkeley, CA.

Figure 2.--Heavily defoliated mountain hemlock along Ulm Peak Road in 1979, that were top-killed or dead by 1980.

NOTES ON LIFE HISTORY AND HABITS

This budworm has a 1-year life cycle. It spends the winter in the pupal stage. We still have not determined where or when eggs are laid because no egg masses have been found. However, by late May or early June the moths (fig. 3) probably have flown and laid their eggs. The larvae feed from July into the fall months, at which time they pupate in shelters of webbed needles (Tunnock and Hard, 1980).

During the fall of 1979, pupae were very abundant on defoliated trees in the Ulm Peak area. However, in May 1980 they were scarce throughout the infested area. This caused us to suspect that the population had collapsed from winter mortality.

On July 10, 1980, an examination of new foliage from the Ulm Peak area indicated that light populations of first instars were feeding. By August 11, 1980, larvae were mostly in the third instar.

On August 19, 1980, defoliation was heavy around Ulm Peak and almost all larvae appeared to be third instars. Many larvae were spinning out of the heavily defoliated trees, perhaps searching for new foliage. Ants were abundant in the area and preyed heavily on wandering larvae.

On September 4, 1980, defoliation could be detected easily by aerial survey.

On November 20, 1980, no pupae could be detected on defoliated understory trees that were snow covered in the Ulm Peak area. Most of the damaged needles on these trees had been removed by wind, rain, and snow.

We suspect that during the winter most pupae fall off with the dried, webbed, needles and "work" into the duff. Some larvae probably spin down and pupate in the duff or other protected spots. Pupal mortality during the winter must be very high due to predation and physical injury, but residual populations seem to have the potential of causing heavy defoliation.

Figure 3.--An adult with wings spread.

RESEARCH ACTIVITIES

During the 1980 summer, live late instar larvae were shipped to the Pacific Southwest Forest and Range Experiment Station at Berkeley, California. Personnel from their Insecticide Evaluation Project assessed the efficacy of three insecticides on these larvae. Results 2/ showed that 90 percent mortality was achieved after 14 days with the following applications:

Sevin-4-oil: 5.76 oz./acre
Orthene 755: 2.18 oz./acre
Bay Sir 8514: 0.55 oz./acre

Suggested application rate in lbs/gal/acre, were:

Sevin-4-oil: 4.3
Orthene 755: 2.0
Bay Sir 8514: 0.4

The above treatments cannot be recommended for operational use until field tests are conducted and the formulations have proven to be effective.

2/ Letter from Jacqueline L. Robertson, October 31, 1980. Pacific Southwest Forest and Range Experiment Station, Berkeley, CA.

Larvae were also sent to Dr. Molly Stock, University of Idaho, who will compare their genetic makeup to other closely related species through isozyme analysis.

REFERENCE

Tunnock, S. and J. Hard. 1980.
A budworm, Argyrotaenia sp., outbreak on the Wallace and Cabinet Ranger Districts, Idaho Panhandle and Kootenai National Forests. USDA-For. Serv., State and Private For., Missoula, Montana Report No. 80-5, 8 p.

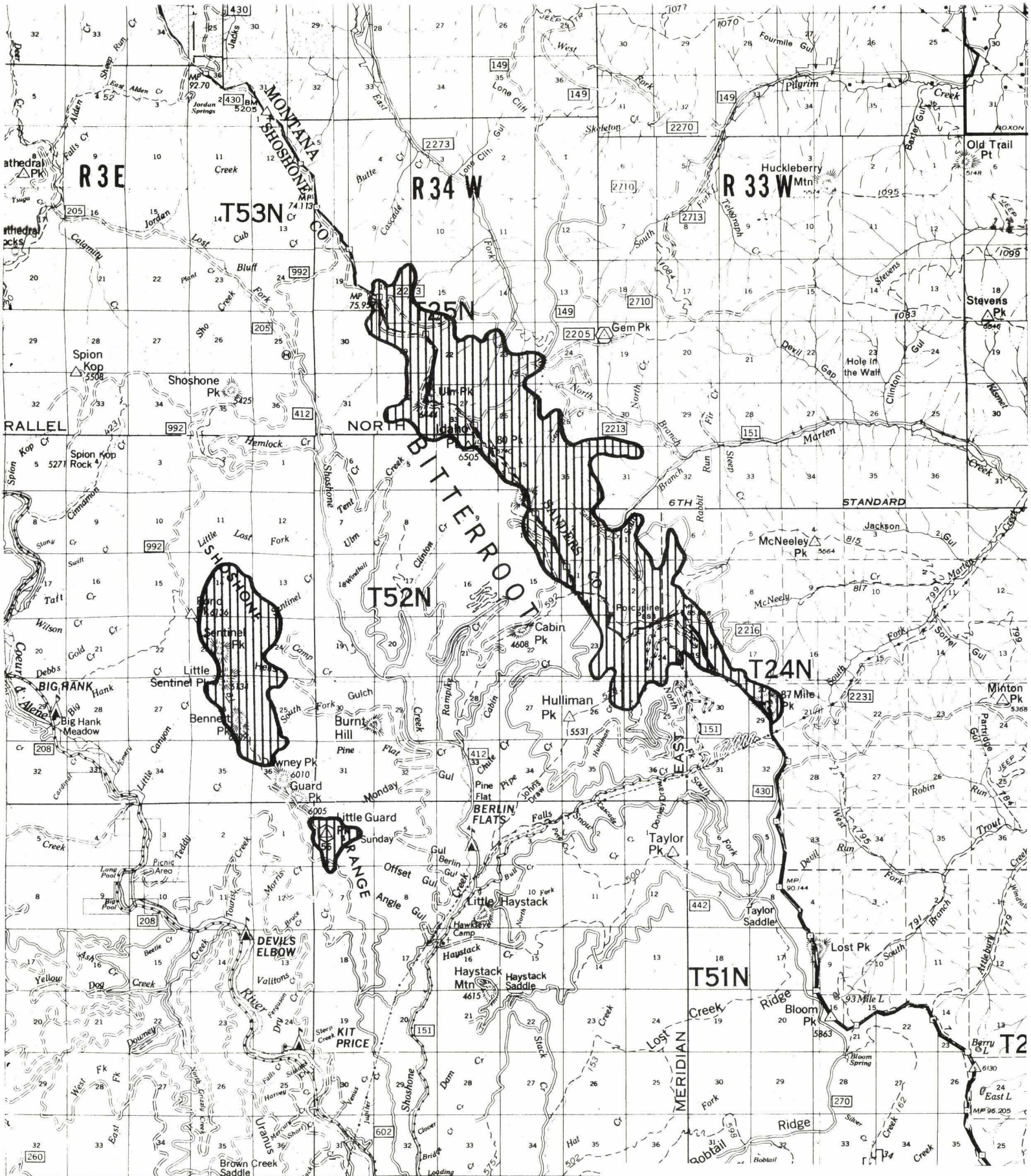

Figure 1.--Argyrotaenia sp. infestations in 1980.

Areas of aerially visible defoliation